

WASHINGTON DEPARTMENT OF ECOLOGY
ENVIRONMENTAL ASSESSMENT PROGRAM
FRESHWATER MONITORING UNIT
STREAM DISCHARGE TECHNICAL NOTES

STATION ID: 46B060
STATION NAME: Roaring Creek near Mouth
WATER YEAR: 2013
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Introduction

Watershed Description

Roaring Creek is a minor tributary, approximately 6% of the drainage area of the Entiat River, and enters the watershed at river mile 5.7. The watershed is bound at its headwaters by Chumstick Mountain (5820 ft) to the west, Roaring Ridge to the north, and Dinkleman Ridge to the south. Land cover above the gage consists of predominantly coniferous forest and shrub-steppe habitats, but also includes riparian woodlands and bedrock/talus slopes. Below the gage rangeland and fruit orchards predominate. Mean annual precipitation across the watershed above this gage location is 33 inches (U.S. Weather Bureau, 1965).

Gage Location

The telemetered stream gaging station on Roaring Creek was installed on September 27, 2002. The gage is located off Roaring Creek Road, approximately 0.80 miles upstream of its confluence with the Entiat River, on the left bank.

Table 1.

Drainage Area (square miles)	25 (USGS, 2015)
Latitude (degrees, minutes, seconds)	47°41'15" N
Longitude (degrees, minutes, seconds)	120°19'56" W

Discharge

Table 2. Discharge Statistics.

Mean Annual Discharge (cfs)	5.7
Median Annual Discharge (cfs)	3.2
Maximum Daily Mean Discharge (cfs)	25
Minimum Daily Mean Discharge (cfs)	0.08
Maximum Instantaneous Discharge (cfs)	28
Minimum Instantaneous Discharge (cfs)	0.03
Discharge Equaled or Exceeded 10 % of Recorded Time (cfs)	16
Discharge Equaled or Exceeded 90 % of Recorded Time (cfs)	0.36
Number of Days Discharge is Greater Than Range of Ratings	0
Number of Days Discharge is Less Than Range of Ratings	41

Note: Statistics displayed in Table 2 may not include values in which the predicted discharge exceeds the range of ratings.

Narrative

Seven discharge measurements were taken, ranging from 0.06 to 10.4 cfs. Snowmelt runoff began early March, and reached its peak on May 10, 2013, after a period of hot weather. The minimum discharge was recorded during baseflow conditions on August 28, 2013. Forty-one days at the beginning of the water, and predominantly in July and August, were below half of the lowest measured discharge, resulting in a discharge that is less than the value reported.

Error Analysis

Table 3. Error Analysis Summary.

Logger Drift Error (% of discharge)	13.4%
Weighted Rating Error (% of discharge)	17.2%
Total Potential Error (% of discharge)	30.6%

Rating Table(s)

Table 4. Rating Table Summary

Rating Table No.	131	141	132
Period of Ratings	10/01/2012-10/10/2012	10/01/2012-02/19/2013	01/29/2013-04/02/2013
Range of Ratings (cfs)	0.03-2490	0.36-2490	0.03-2490
No. of Defining Measurements	14	9	14
Rating Error (%)	16.9%	17.4%	16.9%

Rating Table No.	142	133	
Period of Ratings	3/29/2013-8/28/2013	8/9/2013-9/30/2013	
Range of Ratings (cfs)	0.36-2490	0.03-2490	
No. of Defining Measurements	9	14	
Rating Error (%)	17.4%	16.9%	

Rating Table No.			
Period of Ratings			
Range of Ratings (cfs)			
No. of Defining Measurements			
Rating Error (%)			

Narrative

The water year began amidst a phased period between Table 131 and Table 141, which became valid on October 10, 2012. At the end of January, Table #141 was phased into Table #132 (a clone of Table #13) in which the slow onset of spring runoff scoured the control. In late March, Table #132 was phased into #142 (a clone of Table #14) in which the increase in spring runoff was accompanied by an apparent deposition in the control. Finally, in early August, Table #142 was phased into Table #133 (a clone of Table #13) in which scour of the control occurred, possibly due in aggregate to late summer rain events and fluctuating irrigation activity.

Stage Record

Table 5. Stage Record Summary

Minimum Recorded Stage (feet)	0.35
Maximum Recorded Stage (feet)	1.85
Range of Recorded Stage (feet)	1.50
Number of Un-Reported Days	3
Number of Days Qualified as Estimates	97
Number of Days Qualified as Unreliable Estimates	0

Narrative

Three days were unreported due to an ice-impacted channel in which the stage-discharge relationship was not valid. The stage record is considered an estimate for 97 days during the water year. Sixty-one of those days were qualified as estimates because the logger drift exceeded 20 percent, and the difference in reported discharge was greater than 0.50 cfs. The remaining 36 qualified days occurred near periods of ice-impacted data prior to the first ice-free gage observation.

Modeled Discharge

Table 6. Model Summary

Model Type (Slope conveyance, other, none)	---
Range of Modeled Stage (feet)	---
Range of Modeled Discharge (cfs)	---
Valid Period for Model	---
Model Confidence	---

Surveys

Table 7. Survey Type and Date (station, cross section, longitudinal)

Type	Date

Activities Completed

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